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ORIGINAL

Knowledge of the protocol to be followed in the event of an accident with a sharp object during the clinical practice of undergraduate students in the subject Integrated Adult Clinical and Surgery III, School of Dentistry, Universidad Abierta Interamericana, Buenos Aires, Argentina, 2024

Conocimiento del protocolo a seguir en caso de ocurrir accidente con elemento cortopunzante durante la práctica clínica de los estudiantes de pregrado en la asignatura Clínica y Cirugía integradas del adulto III, de la escuela de Odontología de la Universidad Abierta Interamericana, Buenos Aires, Argentina, 2024

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ABSTRACT

Sharp accidents frequently occur during the practice of dentistry, due to the use of sharp and pointed elements. This usually happens to dentists and especially to students, due to conditions attributable to the practice itself, such as: stress, movement of the patient, reduced space, among others. Through an accident with sharps it is possible to generate inoculation of pathogenic agents when exposed to contaminated biological substances, the main pathogenic agents identified in various studies are: HIV, Hepatitis B virus, Hepatitis C virus, among others. Biosafety protocols have been established to make dental practice safe for the operator and the patient, with the aim of minimising the possibility of cross-contamination. However, in the event of an incident involving sharp material, it is vitally important that the professional or student is well informed about the prophylaxis protocol to be followed in order to reduce the possibility of infection. This descriptive, cross-sectional research aims to investigate the knowledge of the students of the adult III clinics of the School of Dentistry of the Universidad Abierta Interamericana, Buenos Aires, Argentina 2024, regarding this important aspect of biosafety. For this purpose, a survey will be applied to verify the knowledge of preventive biosafety measures, knowledge of pathogenic agents and knowledge of the protocol for post-accident prophylaxis with sharp sharps.

Keywords: Biosafety; Sharps; Percutaneous Injuries; Post-Exposure Prophylaxis for Sharps Exposure.

RESUMEN

Es frecuente que ocurran accidentes cortopunzantes durante la práctica odontológica, motivado al uso de elementos afilados y puntiagudos, suele ocurrir a los odontólogos y especialmente a los estudiantes, por condiciones atribuibles a la misma práctica, como: estrés, movimiento del paciente, espacio reducido, entre otros. Mediante un accidente con elementos cortopunzantes es posible generar inoculación de agentes patógenos al exponerse a sustancias biológicas contaminadas, los principales agentes patógenos identificados en diversos estudios son: VIH, Virus de Hepatitis B, Virus de Hepatitis C, entre otros. Se han establecido protocolos de bioseguridad para hacer la práctica odontológica segura para el operador y el paciente, con la finalidad de reducir al mínimo la posibilidad de contaminación cruzada, sin embargo en caso de que se produzca el incidente con material punzo cortante, es de vital importancia que el profesional o estudiante esté bien informado sobre el protocolo de profilaxis que debe seguir para disminuir la posibilidad de infección. La presente investigación de tipo descriptiva, de diseño transversal pretende indagar sobre el conocimiento de los estudiantes de las clínicas del adulto III, de la escuela de Odontología de la Universidad Abierta Interamericana, Buenos Aires, Argentina 2024, respecto a este importante aspecto de la bioseguridad, para ello se aplicará una encuesta donde se verificará el conocimiento sobre medidas de bioseguridad preventivas, conocimiento de agentes patógenos y conocimiento de protocolo de profilaxis post accidente con punzo cortante.

Palabras clave: Bioseguridad; Cortopunzante; Lesiones Percutáneas; Profilaxis Post Exposición a Elemento Cortopunzante.

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INTRODUCTION

Various studies have demonstrated the occupational risk for healthcare workers of transmission of pathogens through blood and other bodily fluids. This risk extends to students in related disciplines.[1,2] There is a high incidence of sharps accidents in dental practice among students, regardless of the year of study, which reflects the need to implement measures for the surveillance and prevention of such events due to the enormous potential consequences they often have.[8,11,13]

It is estimated worldwide that up to 44,5 % of healthcare workers report at least one needle stick or accidental sharp injury per year.[12,14,15]

The main microorganisms transmitted through accidental exposure to blood caused by needle injuries or injuries after incidents involving cuts, punctures, or splashes with a risk of infection may include the following:

Viruses

- Hepatitis B virus (HBV).
- Hepatitis C virus (HCV).
- Human immunodeficiency virus (HIV).
- Cytomegalovirus (CMV).
- Epstein-Barr virus (EBV).
- Parvovirus.

Bacteria

- Treponema pallidum (syphilis).
- Yersinia.

Parasites

- Plasmodium.[11,16]

Hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV) infection are diseases that can potentially be transmitted through a sharps accident. However, the risk is different for each disease, as is the protocol applied for prophylaxis in case of a sharp object accident where the subject is exposed to any of these pathogens.[10,12]

Dentistry can be considered a safe profession, provided that effective safety protocols are followed and there is increased awareness and adoption of universal precautions.[17]

It is important to note that Latin America has the highest prevalence of HBV transmission among healthcare workers. The percentage of infections attributable to occupational causes is 52 % for this virus, 65 % for HCV, and 7 % for HIV/AIDS.[18]

According to the WHO, the annual estimate of healthcare workers exposed to blood-borne pathogens is high. Worldwide, it was as follows:

- 2,6 % for HCV.
- 5,9 % for HBV.
- 0,5 % for HIV.

More than 90 % of these infections occur in developing countries like Argentina, but most of these accidents remain unreported. Sharps injuries cause psychological impacts such as stress, fear, and distraction from work. Most of these accidents can be prevented through the use of safety measures.[3]

General Objective

This study aims to determine whether students enrolled in the Comprehensive Clinic and Adult Surgery III course in the 2024 academic year know the protocol to follow in the event of a sharps injury during their clinical activities.

METHOD

The study population consisted of 26 students who make up the integrated adult clinic and Surgery III at the School of Dentistry at the Inter-American Open University, Salta 982.

A survey was administered (adapted from the research: Sneh L. et al. Knowledge, Awareness and Practices regarding Sharp Injuries amongst Dental Students in Lucknow, India).

The data were recorded in a structured system distributed through Google Forms surveys and collected simultaneously. The questionnaire, whose link is as follows: https://forms.gle/5XphrdKJr631uMxSA, consisted of 20 questions and was used to obtain:

- Demographic data.
- Perception of risk of acquiring injuries from sharp instruments Knowledge of the transmission rate of hepatitis B and HIV.
- Knowledge of the steps to follow in case of an accident with a sharp object.
- Knowledge of the authorities and institutions to contact.
- Prevalence of sharp injuries.
- Frequency of sharp injuries.

- Practice during which the injury occurred.
- Mechanism of injury.
- Element that caused the injury.
- Reporting of injuries.
- Protective practices.
- Prevalence of hepatitis B immunization.
- Prevalence of tetanus immunization.
- Immunization status.

The data will be recorded in numbers (N) and percentages (%) tabulated as follows:

- Knowledge, awareness, and practice regarding needle stick injuries among dental students in general.
- Incidence of needle stick injuries among students during various clinical procedures.
- Causes of needle stick injuries among students.
- Knowledge of the prophylaxis protocol to follow in the event of an accident involving a sharp object.

RESULTS



Figure 1. Question 1

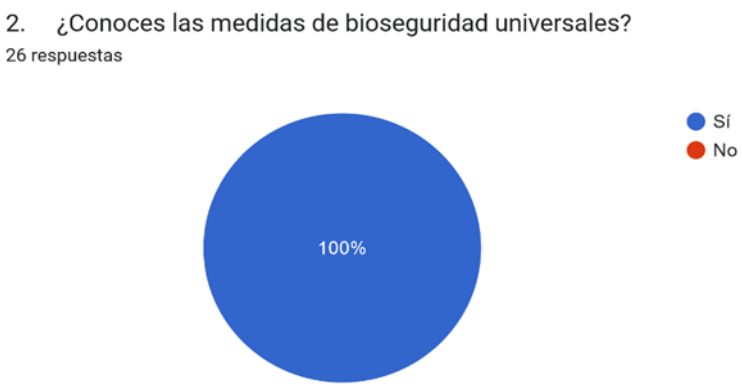


Figure 2. Question 2

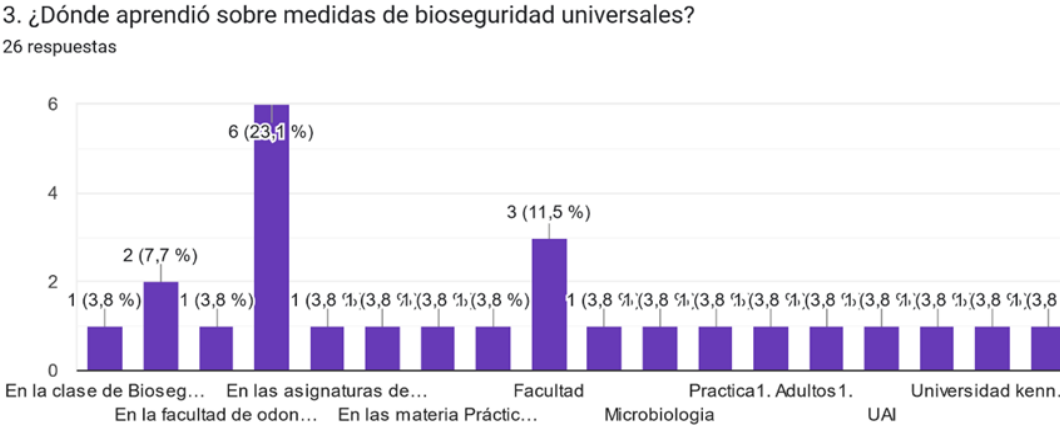


Figure 3. Question 3



Figure 4. Question 4

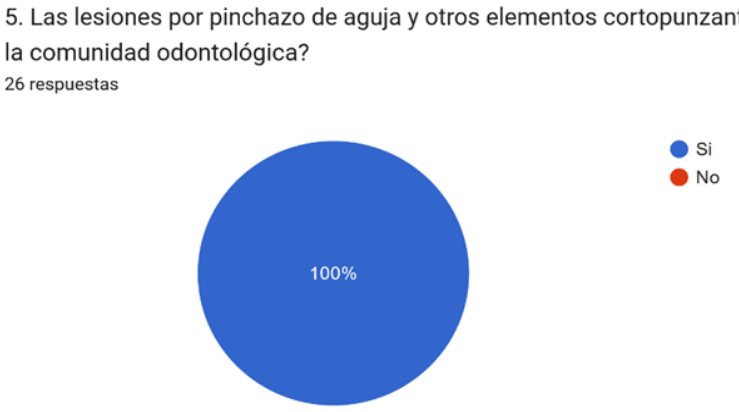


Figure 5. Question 5



Figure 6. Question 6



Figure 7. Question 7

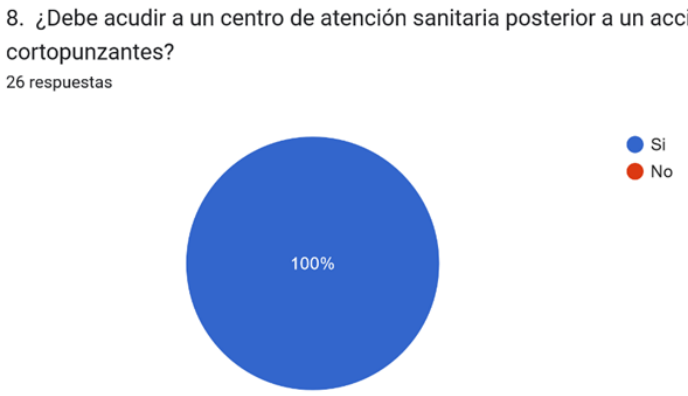


Figure 8. Question 8

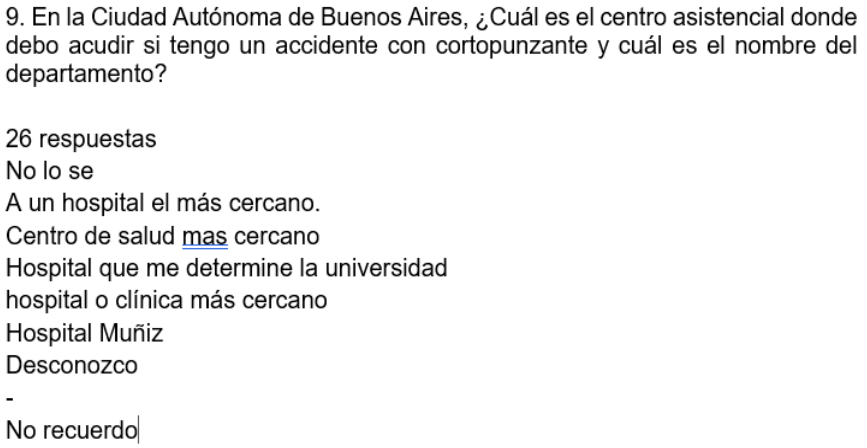


Figure 9. Question 9



Figure 10. Question 10

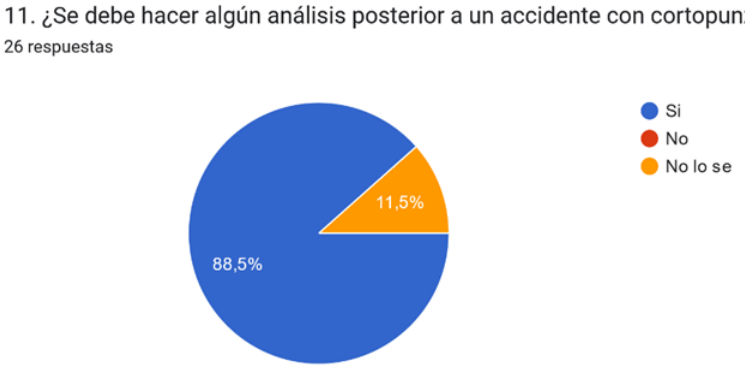


Figure 11. Question 11

12. Si su respuesta anterior fue "Si" ¿Cuál sería el análisis?

Un análisis de sangre si es que el paciente informó de alguna enfermedad por transición de fluidos.
Análisis de sangre
Hiv hepatitis sifilis
hepatograma
Elisa HIV HBs Ag. - anti HCv (ELISA)
0
Hiv hepatitis
No lo se
Extracción de sangre en Laboratorio Central dentro de las primeras 2 horas de producido el accidente.

Figure 12. Question 12

13. ¿Ha experimentado algún accidente con cortopunzantes durante el entrenamiento clínico en los últimos seis meses?
26 respuestas

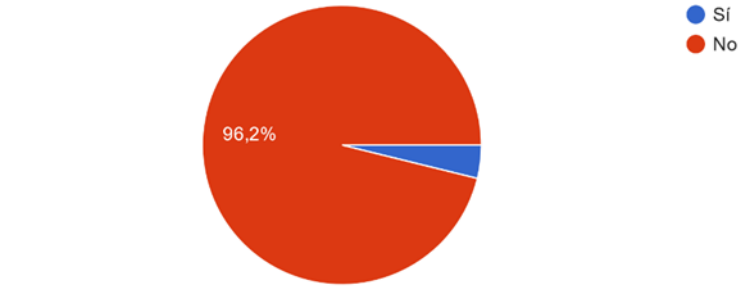


Figure 13. Question 13

14. Número de accidentes con cortopunzantes que haya tenido en los últimos 6 meses durante la capacitación clínica.
26 respuestas

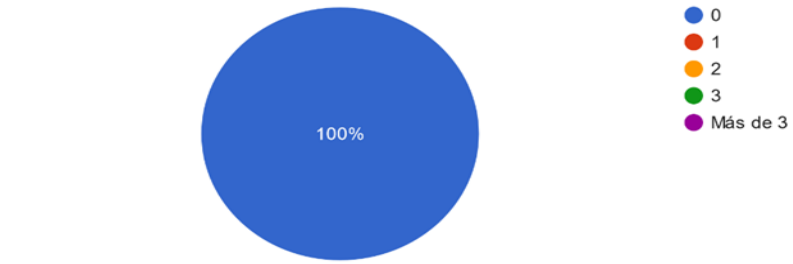


Figure 14. Question 14

15. ¿Cuál fue el elemento causante del accidente?
26 respuestas



Figure 15. Question 15

The results obtained after distributing the survey, in which 100 % of the students who make up the Adult and Surgery III clinic participated.

100 % of the students surveyed stated they knew of the risk of puncture and/or injury with sharp objects during clinical procedures and of universal biosafety measures.

All students learned about biosafety during their university studies in the following courses: Microbiology, Comprehensive Adult Care I and II, and Practice I.

Only 84,6 % of respondents said they knew the post-exposure prophylaxis procedure for sharps injuries in clinical settings.



Figure 16. Question 16



Figure 17. Question 17

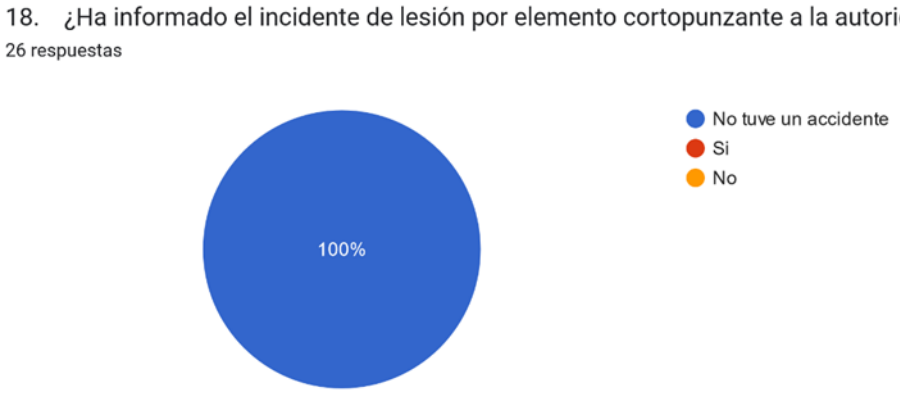


Figure 18. Question 18

7,7 % of students believe hand washing cannot reduce the risk of disease transmission.

100 % of those surveyed said they knew they should go to a health center after a sharps injury, although 11,5 % said they were unaware that this should be done within the first hour of the injury.

When asked which healthcare center they should go to in this type of emergency, the responses were as follows:

- Nearby hospital/health center.
- Infectious disease center.

- A hospital designated by the university.
- Don't know/Don't remember.
- Muñiz Hospital, only 2 of those surveyed.

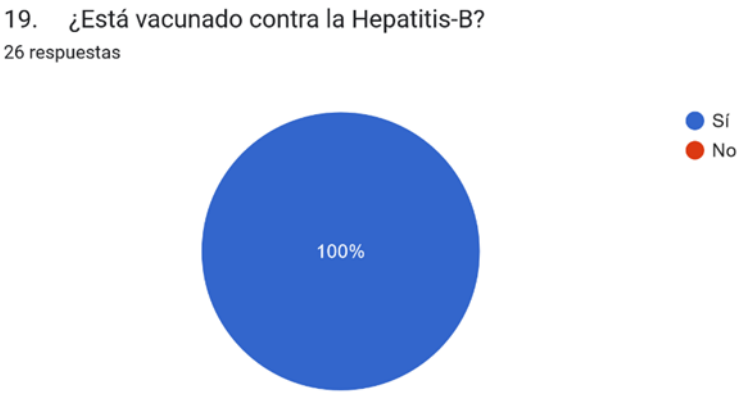


Figure 19. Question 19

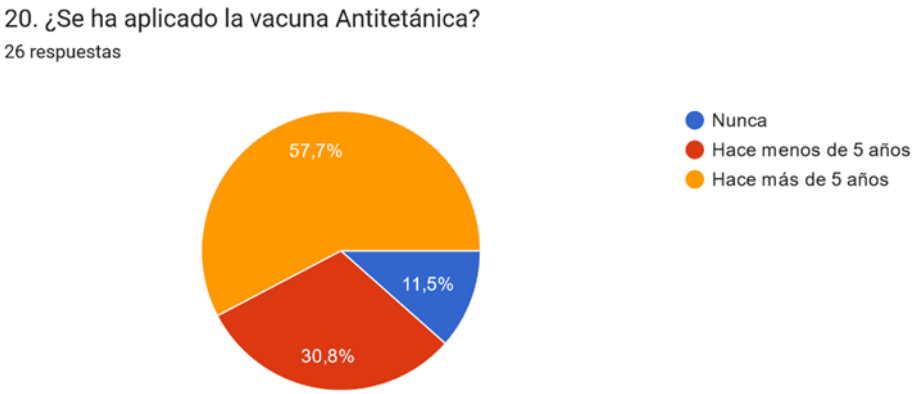


Figure 20. Question 20

4 % of those surveyed believe that not all sharp injuries that occur in the clinic should be reported.

85 % agree that a blood test should be performed after this type of injury, while 11,5 % do not know. However, when asked what the test should be, there is a wide variety of responses, which are described below:

- Blood test (unspecified).
- Liver function test and/or serology.
- HIV, hepatitis B/C
- Sexually transmitted diseases.
- Blood extraction at the central hospital.
- Does not know.
- No response.

3,8 % of the study population said they had had a sharps accident during clinical practice six months before the survey, while 96,2 % of respondents said they had not.

80,8 % of respondents reported receiving education and training in biomedical waste management, while 19,2 % said they had not.

100 % of the study population reported having been vaccinated against hepatitis B.

DISCUSSION

Dental students, whether due to inexperience, lack of care, or lack of biosafety requirements, are predisposed to a much higher incidence within their training field.[25] The results obtained in research from various countries report a variety of results, among which we can mention Ecuador's 82,9 % accident rate with sharp objects in students at the comprehensive clinic of the Faculty.[22] Mexico, dentistry students in Mexico reported an accident rate of 46,6 %;[26] students at the public university in the city of Cartagena, Colombia, reported 46 %;[27] university students in Brazil reported an accident rate of 23,3 %,[2] Paraguay 63 %,[28] 97,3 % was reported in a study in India,[11] in the US there are reports of 66,7 %,[29] 27 % in Australia,[10] 63 % in Croatia,[5] and in Japan 70,3 %.[30]

In Argentina, a study by the University of Córdoba sought to evaluate dental students' knowledge regarding the protocol to follow in an accident involving a sharp object. The study found that 95 % of students said they were aware of the protocol;

however, when asked to describe it, there were steps that they did not include in their responses. As for notifying the group leader or teacher in charge, only 5 % considered it necessary to comply with this step. Regarding promoting bleeding, washing, and applying disinfectants, 55 % could describe the measures, including the steps and disinfectants used. About going to health centers, 57 % of students considered this aspect of the protocol, referring to it using terms such as hospital, medical center, health center, and infectious disease center.

Regarding serological testing of the injured person and the patient, 44 % of students recognized the need to perform serological testing on the injured person. Still, only 21 % mentioned the need to test the patient. However, none mentioned that the patient and the injured person should continue to be monitored long-term. Nineteen percent considered it necessary to take medication, specifying, among other things, vaccines, medication cocktails, and antibiotics. Nine percent indicated antiviral regimens. Only 1 % responded that they would reassess the situation in the short and long term.

A study conducted at the University of La Plata, Argentina, aimed to identify the prevalence of sharps accidents and biological material in dental students. UNLP reported a significant predominance in females (78 %). The most frequent causes of accidents reported were anesthesia needles (52 %), sharp instruments (27 %), suture needles (12 %), biological material (6 %), and irrigation needles (4 %).[32]

About the prevalence of sharps accidents reported in the literature compared to other professions, the profession with the highest incidence of accidents is nursing. The prevalence of biological accidents among students was as follows: in European countries, the figures ranged from 10,2 % to 32 % in nursing, 16 % to 58,8 % in medicine, and 21 % in dentistry. In Asian countries, the percentage in nursing varies from 49 % to 96 %, in medicine from 35 % to 68 %, and in dentistry from 68 % to 75,4 %. In North America, the figures fluctuate around 11-72,7 % in medicine and around 19,1 % in dentistry. Finally, in South America, the prevalence was 31,2-46,7 % in medicine and 40 % in nursing.[33]

CONCLUSIONS

Students enrolled in Comprehensive Clinic and Adult Surgery III in the 2024 academic year have deficiencies in their knowledge of the protocol to follow in the event of a sharps injury during their clinical activities.

They are unaware of the level of risk of accidents in the clinic. Although they say they are aware of such risk, they could not correctly answer what steps to take if they had an incident during practice.

Most of them have the necessary immunizations as a preventive measure in case of sharp object injuries.

Most students know the biosafety measures required to work in the clinic.

Even though the necessary biosafety measures for working in a clinic, the protocol for accidents involving sharp objects, and the authorities to contact in the event of such an accident are taught in the first years of the dentistry program in the microbiology course, which is taught in the second year, it has been found that when students arrive at the adult clinic and surgery III, which is taken in the fifth year of the program, they are largely unaware of these measures, especially regarding where to go when an emergency arises and how to properly report the incident to the appropriate authorities. which is taken during the fifth year of the degree program, they are very unfamiliar with the protocol for accidents involving sharp objects and the authorities to contact in the event of an accident.

Clinical dental practice involves a great deal of responsibility toward patients and ourselves as healthcare professionals. Part of this responsibility is having the basic skills to respond when our physical integrity is accidentally compromised during work. We must master and know how to put into practice the concepts of biosafety, prevention, and the protocol to follow in the event of an accident with sharps in the clinic, as well as the authorities, addresses, and departments to contact, since time is also crucial in these events.

Considering the results of this research, it is suggested that at the beginning of each year, a written manual of steps to follow in the event of a sharp object accident be distributed to students in each clinic. The manual should indicate the authorities to contact, the addresses, and the department where the incident should be reported in order to receive appropriate care and avoid failure to report the incident, as described in the statistics.[3,34]

FINANCING

None.

CONFLICT OF INTEREST

Authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Celeste Moreno Dommar, Maria Isabel Brusca.
Data curation: Celeste Moreno Dommar, Maria Isabel Brusca.
Formal analysis: Celeste Moreno Dommar, Maria Isabel Brusca.
Drafting - original draft: Celeste Moreno Dommar, Maria Isabel Brusca.
Writing - proofreading and editing: Celeste Moreno Dommar, Maria Isabel Brusca.

BIBLIOGRAPHIC REFERENCES

1. Duarte R, Loya M, Sanín L, Reza S. Accidentes por objetos punzocortantes en estudiantes de una escuela de odontología. Ciencia & Trabajo. 2006;8(21):131-134.

2. Shintani T, Iwata T, Okada M, Nakaoka M, Yamasaki N, Fujii T, et al. Clinical outcomes of post-exposure prophylaxis following occupational exposure to human immunodeficiency virus at dental departments of Hiroshima University Hospital. Curr HIV Res. 2020;18:475-479.

3. Maimoona N, Fasahat K, Syed S, Zafar Z, Amna R, Hassan M. Evaluation of awareness, frequency and type of occupational injury in dental personnel: A cross-sectional study. Ann Abbasi Shaheed Hosp Karachi Med Dent Coll. 2022;27(2).

4. Martins A, Pereira R, Ferreira R. Compliance with occupational post-exposure protocol for injuries among dental surgeons. Rev Saude Publica. 2010;44(3):528-540.

5. Pavičin I, Lovrić Z, Zymber A, Vodanović M. Occupational injuries among dentists in Croatia. Acta Stomatol Croat. 2020;54(1):51-59.

6. Rana M, Malti M, Kushwaha R, Sneh V, Reema K. Knowledge, awareness, and practices regarding sharp injuries amongst the dental students. Int J Oral Health Dent. 2017;3(3):181-187.

7. Peinado J, Llanos A, Seas C. Injurias con objetos punzocortantes en el personal de salud del Hospital Nacional Cayetano Heredia. Rev Med Hered. 2000;11(2).

8. Freitas L, Barbosa W, Costa L, Lucena L, Benício C, Leite A. Needlestick and sharp instruments injuries among Brazilian dentistry students. Contemp Clin Dent. 2017;8(1):1-6.

9. Kapoor V, Ramandeep S, Simarpreet S, Sanjeet G, Agiapal S. Knowledge, awareness, and practice regarding needlestick injuries in dental profession in India: A systematic review. Niger Med J. 2013;54(6):6.

10. Leggat P, Smith D. Prevalence of percutaneous exposure incidents amongst dentists in Queensland. Aust Dent J. 2006;51(2):158-161.

11. Sneh Lata et al. Knowledge, awareness, and practices regarding sharp injuries amongst the dental students in Lucknow, India. Sch J Dent Sci. 2018;5(8):393-404.

12. Universidad de Buenos Aires, Facultad de Odontología, Hospital Odontológico Universitario. Profilaxis de accidentes post exposición a sangre o derivados.

13. Al Dakhil L, Yenugadhati N, Al-Seraihi O, Al-Zoughool M. Prevalence and associated factors for needlestick and sharp injuries (NSIs) among dental assistants in Jeddah, Saudi Arabia. Environ Health Prev Med. 2019;24:60.

14. Abalkhail A, Kabir R, Elmosaad Y, Alwashmi A, Alhumaydhi F, Alslamah T, et al. Needle-stick and sharp injuries among hospital healthcare workers in Saudi Arabia: A cross-sectional survey. Int J Environ Res Public Health. 2022;19:6342.

15. Alshehri S, Kayal M, Alahmad Almshhad H, et al. The incidence of needlestick and sharps injuries among healthcare workers in a tertiary care hospital: A cross-sectional study. Cureus. 2023;15(4):e38097.

16. Samaranayake L, Scully C. Needlestick and occupational exposure to infections: A compendium of current guidelines. Br Dent J. 2013;213(4).

17. Antunes D, Vergara C, Díaz A, Murta Z. Accidentes con material biológico entre estudiantes universitarios de odontología. Rev Clin Med Fam. 2011;4(1):19-24.

18. Mateo B, Torres G, Manet L, Saldivar I. Comportamiento de la exposición percutánea y mucosa a sangre y fluidos corporales en cooperantes cubanos de la salud. Correo Científico Médico. 2016;20(1).

19. Universidad Nacional de Córdoba, Facultad de Odontología. Protocolo a seguir ante un accidente de los estudiantes con elementos cortopunzantes. Res.148/14 HCD.

20. Facultad de Odontología, Universidad Nacional de Cuyo. Manual de procedimientos protocolo de bioseguridad. 2004.

21. Universidad Nacional del Nordeste, Facultad de Odontología. Manual y normas de bioseguridad.

22. Cazar T, Lanas G. Valoración epidemiológica de accidentes percutáneos de riesgo biológico en estudiantes y docentes de la

clínica integral, Facultad de Odontología. Odontología. 2016;18(1):47-52.

23. Centro de Control y Prevención de Enfermedades. Workbook for designing, implementing, and evaluating a sharps injury prevention program. 2008.

24. Yélamos MC, Guzmán Vera CK, Martínez Vidal M, Álvarez Castillo MC, Sagües Cifuentes MJ. Accidentes percutáneos con riesgo biológico producidos por dispositivos de seguridad en la Comunidad de Madrid. Med Segur Trab. 2012;58(227):82-97.

25. Antunes Freitas D, Vergara Hernández CI, Díaz Caballero A, Murta Morais Z. Accidentes con material biológico entre estudiantes universitarios de odontología. Rev Clin Med Fam. 2011;4(1):19-24.

26. Arrieta Vergara K, Díaz Cárdenas S, González Martínez F. Prevalencia de accidentes ocupacionales y factores relacionados en estudiantes de odontología. Rev Salud Publica. 2013;15(1).

27. Rey A, Ruiz A, Ruiz D, Silvero V. Frecuencia de accidentes con riesgo biológico en estudiantes y egresados de la Facultad de Odontología de la Universidad Nacional de Asunción. Biblioteca Responsable PY8.1, LILACS. 2009.

28. Shah S, Merchant A, Dosman J. Percutaneous injuries among dental professionals in Washington. BMC Public Health. 2006;6:269.

29. Kobayashi K. Questionnaire study of needlestick injuries and hepatitis B vaccination in general dental practices. Jpn J Infec Prev Cont. 2015;30(5):348-353.

30. Castillo G, Castillo M. Conocimientos sobre riesgos y profilaxis preventiva en estudiantes de odontología. Rev Salud Publica. 2009;13(2):32-38.

31. Fingermann G, Rom M, Rancich L, Rueda L. Prevalencia de accidentes punzocortantes y material biológico en estudiantes de odontología. UNLP. 2015.

32. Sánchez C, Rojas C, Calles J. Riesgo de accidentes biológicos en estudiantes de la salud: Revisión de la literatura en los últimos 14 años [Internet]. Universidad del Rosario. 2024 [citado 2024 Nov 15]. http://repository.urosario.edu.co/handle/10336/11799.

33. World Health Organization (WHO). Reducing risks, promoting healthy life. Geneva; 2002.http://www.who.int/whr/2002/en/whr02_en.pdf.